

CLAIMS

We claim:

- 5 1. An infrared identification system for
identifying military vehicles as friendly or hostile,
comprising:
 means for introducing trace quantities of a
seed formulation into the exhaust of a friendly
10 vehicle; and
 means for detecting the spectrally-discrete
thermal emissions of the seed formulation to identify
the vehicle as friendly.
- 15 2. The identification system as set forth in
claim 1, wherein the detecting means includes:
 an infrared detector;
 an optical lens for collecting and concen-
trating the infrared radiation onto the infrared
20 detector;
 a high-resolution bandpass filter centered
at a frequency of one of the spectrally-discrete
thermal emissions of the seed formulation;
 a threshold trigger; and
25 indicating means;
 wherein the threshold trigger activates the
indicating means when the total energy output by the
bandpass filter exceeds a predetermined value, there-
by indicating that the vehicle is friendly.
- 30 3. The identification system as set forth in
claim 1, wherein the introducing means includes:
 a pressurized tank for storing the seed
formulation;
35 a valve for releasing the seed formulation

from the tank; and

a nozzle for injecting the seed formulation into the exhaust of the vehicle.

5 4. The identification system as set forth in claim 1, wherein the seed formulation is selected from a group consisting of the halides hydrogen chloride (HCl), hydrogen bromide (HBr), hydrogen iodide (HI) and hydrogen fluoride (HF).

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5. The identification system as set forth in claim 1, wherein the seed formulation is selected from a group consisting of the hydrides sodium hydride (NaH), calcium hydride (CaH) and potassium
15 hydride (KH).

6. The identification system as set forth in claim 1, wherein the seed formulation is selected from a group consisting of the oxides beryllium oxide
20 (BeO), germanium oxide (GeO), magnesium oxide (MgO), selenium oxide (SeO) and aluminum oxide (AlO).

7. The identification system as set forth in claim 1, wherein the trace quantities of the seed
25 formulation range in concentration from approximately 0.1 to 2% of the exhaust of the vehicle.

8. The identification system as set forth in claim 3, wherein the seed formulation is injected
30 into a combustor of an engine of the vehicle.

9. The identification system as set forth in claim 3, wherein the seed formulation is injected into the fuel before being burned in an engine of the
35 vehicle.

10. The identification system as set forth in claim 3, wherein the seed formulation is injected into the exhaust of the vehicle as the exhaust exits the vehicle.

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11. The identification system as set forth in claim 3, wherein the seed formulation is injected into the exhaust of the vehicle only when interrogated by a friendly source.

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12. The identification system as set forth in claim 3, wherein the seed formulation is injected into the exhaust of the vehicle continuously.

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13. A method for identifying military vehicles as friendly or hostile, comprising the steps of:

introducing trace quantities of a seed formulation into the exhaust of a friendly vehicle; and

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detecting the spectrally-discrete thermal emissions of the seed formulation to identify the vehicle as friendly.

14. The identifying method as set forth in claim 13, wherein the step of detecting includes the steps of:

concentrating the infrared radiation onto an infrared detector with an optical lens;

filtering the output of the infrared detector with a high-resolution bandpass filter centered at a frequency of one of the spectrally-discrete thermal emissions; and

indicating that the vehicle is friendly when the total energy output by the bandpass filter exceeds a predetermined value.

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15. The identifying method as set forth in claim 13, wherein the step of introducing includes the steps of:

5 storing the seed formulation in a pressurized tank;

releasing the formulation from the tank with a valve; and

10 injecting the seed formulation into the exhaust of the vehicle with a nozzle.

16. The identifying method as set forth in claim 13, wherein the seed formulation is selected from a group consisting of the halides hydrogen chloride (HCl), hydrogen bromide (HBr), hydrogen
15 iodide (HI) and hydrogen fluoride (HF).

17. The identifying method as set forth in claim 13, wherein the seed formulation is selected from a group consisting of the hydrides sodium
20 hydride (NaH), calcium hydride (CaH) and potassium hydride (KH).

18. The identifying method as set forth in claim 13, wherein the seed formulation is selected
25 from a group consisting of the oxides beryllium oxide (BeO), germanium oxide (GeO), magnesium oxide (MgO), selenium oxide (SeO) and aluminum oxide (AlO).

19. The identifying method as set forth in
30 claim 13, wherein the trace quantities of the seed formulation range in concentration from approximately 0.1 to 2% of the exhaust of the vehicle.

20. The identifying method as set forth in
35 claim 15, wherein the seed formulation is injected

into a combustor of an engine of the vehicle.

21. The identifying method as set forth in claim 15, wherein the seed formulation is injected
5 into the fuel before being burned in an engine of the vehicle.

22. The identifying method as set forth in claim 15, wherein the seed formulation is injected
10 into the exhaust of the vehicle as the exhaust exits the vehicle.

23. The identifying method as set forth in claim 15, wherein the seed formulation is injected
15 into the exhaust of the vehicle only when interrogated by a friendly source.

24. The identifying method as set forth in claim 15, wherein the seed formulation is injected
20 into the exhaust of the vehicle continuously.